Infection with Kala Azar Among Children in Babylon Province and Their Effect on Hematocrit Reading and Their Relation with Blood Type

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Abstract

A prospective study of Hospitalized cases of children in Babylon Maternity and Children Hospital , Al-Hilla General Hospital and Al-Hashmya Hospital was carried out from 1st September 2007 to 1st March 2008, blood samples were collected . It has been documented 54 patients of children were infected with *Leishmania donovani* (Kala azar) by positive serological test (IFAT) . The age of those children was between 3 months to 3 years old , they were divided into two groups (under 1 years old and 1-3 years old). Hematocrit of these children were measured and compared with Hematocrit of other healthy children . Blood group test (ABO) was also carried out. Kala Azar was highly number in children within age 1-3 years old (46).Also Al-Hashmya district showed highly number of Leishmaniasis(32)than other districts including Al-Mahaweel , Al-Hilla and Ashomaly(9,7and6) respectively Leishmaniasis caused highly significant decrease ($p<0.01$) in hematocrit of children under one years old (27.13 ± 1.48) and highly significant decrease ($p<0.001$) in hematocrit of children within 1-3 years old (26.96 ± 0.39). Kala Azar was highly percentage in blood group type A (24.5%)as compared with other blood group type O,B and AB(24%,20.3%and12.9%)respectively.

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Introduction

Visceral leishmaniasis or(kala azar) is a systemic disease which is caused by *Leishmania donovani* complex(Fakhar *et al.*, 2006) which is known to be endemic in areas of the middle east including Yemen , Oman , Kuwait , Iraq , Saudi Arabia , United Arab Emirates and Bahrain (Zeibig ,1997 ; Elnour *et al.*, 2001 ; Al-Marzoki , 2002 ; Al-Muhamadi *et al.*, 2004 ; Fakhar *et al.*, 2006) as well as in Tunis (Khaldi *et al.*, 1991) and Turkey (Ozensoy *et al.* 1998) . In Europe visceral leishmaniasis are endemic in all Mediterranean countries such as southern France (Mindoier *et al.*, 1998) Southern Greece (Maltezou *et al.*, 2000) and Southern Spain (Pineda *et al.*, 1998) Also there is documented cases of kala azar in central European countries such as Germany (Bogdan *et al.*, 2001)

Materials and Methods

Hospitalized cases of children in Babylon Maternity and Children Hospital , Al-Hilla General Hospital and Al-Hashmya Hospital was carried out from 1st September 2007 to 1st March 2008 . It has been diagnosed 54 patients of children were infected with *Leishmania donovani* by demonstrate *Leishmania* antibody in their sera by using indirect Immunofluorescent Antibody Technique (IFAT) according to Randox Co. kit ,as recommended by manufacture.

The age of those children was between 3 months to 3 years old , which arranged into two groups . First group from 3 months to under one year . Second group from one year to three years old (Al-Muhammadi *et al.,* 2004) .

Blood was collected by antecubital veinpuncture at 9–11 a.m. Hematocrit (Hct) of these children was measured according to Talib & Khurana (1996) , and compared with Hct of other healthy children (control 5 children of each age group). Blood group ABO test was carried out according to Talib & Khurana (1996). Results of Hct were statistical analyzed using t-test (Campbell , 1967).

Results and Discussion

Table (1) shows highly number of visceral leishmaniasis in children within 1-3 years old(46) as compared with the number of infection in children under one years old (8) which agree with the results of Mindoier *et a*l.(1998) . This goes with the fact that the infantile type is the commonest type in our area (Al-Marzoki , 2002) and may be the symptoms can be persist for weeks to several months before patients come to medical attention (Ravanbod, 2002).

There was no such difference in the sex factor (male: female 31:23) of visceral leishmaniasis in children which agree with Al-Marzoki (2002) and Al-Muhammadi *et al*.(2004) .

In table (2) , Al-Hashmya district showed highly number of kala azar infection (32) than other districts of Babylon province including AL-Mahaweel, Al-Hilla and Ashomaly (9,7and6) respectively, this agree with Al-Marzoki (2002) and Al-Muhammadi *et al*.(2004) .

Iraq has been reported to be one of the endemic area of Kala azar (Zeibig ,1997; Al-Marzoki , 2002 ; Al-Muhamadi *et al.,* 2004). The high prevalence of leishmaniasis in Al-Hashmya district and then Al-Mahaweel district may be due to the highly prevalence of the vector (Sandflies) of visceral *Leishmaniasis* in these specific area that get a big attention for controlling in this area .

Visceral leishmaniasis caused highly significant decrease ($p<0.01$) in Hct of children under one years old (27.13±1.48) and very high significant decrease ($p<0.001$) in Hct of children within 1-3years old (26.96±0.39) as shown in table (3) . This result agree with Al-Muhammadi *et al*.(2004). That is to say visceral leishmaniasis caused anemia (Mindoier *et al.,* 1998; Ozensoy *et al.,* 1998; Maltezou *et al.,* 2000; Elnour *et al.,* 2001 ; Al-Muhammadi *et al.,* 2004 ; Joshi *et al.,* 2006) . Anemia always present with leishmaniasis and may be severe , it is usually normocytic normochromic and appears due to a combination of factors including hemolysis , marrow replacement with visceral *Leishmaniasis* infected macrophages , hemorrhage , splenic sequestration of erythrocytes , hemodilution (Ravanbod,2002) and due to effect of malnutrition (Al-Marzoki , 2002) then it appears as iron deficiency (Microcytic hypochromic) anemia (Elnour *et al.,* 2001). In table (4)visceral leishmaniasis was highly percentage in blood group type A (42.5%) as compared with other blood group types O, B, and AB (24%,20.3%and12.9%) respectively This was agree with (Al-Mamouri , 2000) who found that protozoa related with type A blood group due to the presence of genetic factors and the antigens of these protozoa are similar to the antigens of type A blood group subjects and so do not recognized by immune system.

Table (1) : Distribution of Leishmaniasis according to age and sex .

Age(year)	Male	percentage	Female	percentage
Less than 1	3	5.5	5	9.2
1-3	28	15.8	18	33.3
Total	31	57.4	23	42.5

Table (2) : Distribution of leishmaniasis according to location .

No	Location		Patient	percentage
1	**Al-Hilla District**	**Al-Hilla center** **Al-Tuhmazya**	**7**	**12.9%**
2	**Al-Mahaweel District**	**Al-Mahaweel center** **Jibalah** **Al-Neel center**	**9**	**16.6%**
3	**Al-Hashmya District**	**Al-Hashmya center** **Al-Qassim** **Al-Midhatya**	**32**	**59.2%**
4	**Ashomaly District**		**6**	**11.1%**
	Total		**54**	**100**

Table (3) : Effect of leishmaniasis on hematocrit reading .

Age(year)	Hematocrite reading (percentage)	
	Control	Patient
Less than 1	34 ± 0.39	27.13 ± 1.48*
1 – 3	36.2 ± 1.48	26.96 ± 0.39**

* Significant decrease ($p<0.01$)

** Significant decrease ($p<0.001$)

Table (4) : Relation of leishmaniasis with blood group (ABO).

Blood group	No.of patients	percentage
A	23	42.5
B	11	20.3
O	13	24.0
AB	7	12.9
Total	54	100

Recommendation :

From above we recommend

1. The screening (Survey) study should be taken on the areas close to those documented endemic areas in this study.
2. Protection against sandflies accomplished by repellents, protective clothing are essential measures to reduce future *L. donovani* infection. Promote treatment of human infections as well as control of sandflies population will also help to control of disease .

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خمج اللشمانيه الاحشائيه لدى أطفال بعض مناطق محافظة بابل وتأثيرها على قيم مكداس الدم وعلاقته بفصائل الدم

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الخلاصة

أجريت هذه الدراسة لأربعة وخمسين طفلاً في مستشفى بابل للاطفال والـولادة ومستشـفى الحلـة التعليمي ومستشفى الهاشمية للفترة من 2007/9/1 ولغاية 2008/3/1 حيث تم جمع عينات الـدم للأطفـال المشكوك بأخماجهم للشمانيه الا حشائيه *Leishmania donovani*، تراوحت اعمارهم من ثلاثة اشهر الى ثلاث سنوات ، وقد صنفت العينات الى فئتين عمريتين الاولى تضمنت الاطفال من هم دون السنة والثانيـة للاطفال المتراوحة اعمارهم بين سنة الى ثلاث سنوات . تم تشخيص الخمج باللشمانية باعتماد فحص التألق المناعي IFAT كما اجري فحص نسبة مكداس الدم Hematocrit لمعرفة تاثير الخمج عليه بمقارنتـه مـع اطفال اصحاء وكذلك تم فحص فصيلة الدم Blood group لبيان علاقتها بالخمج.

بلغت اعلى عدد خمج للاطفال بين السنة والثلاث سنوات حيث بلغت 46 مخمجا من الاصابة الكلية . سجل قضاء الهاشمية اعلى عدد خمج باللشمانيه الاحشائيه(32) مقارنة بقضاء المحاويل والحلة والشوملي (6,7,9على التوالي) . كان هناك انخفاضا معنويا (P<0.01) في نسبة مكداس الـدم للاطفـال المخمجـين 27.13% مقارنة بغير المخمجين 0.39% للاطفال دون السنة الواحدة وانخفاضاً معنويا عاليـا(P<0.01) بنسبة مكداس الدم للاطفال المخمجين الذين تراوحت اعمارهم بين 1 الى 3 سنوات 0.39%مقارنة بالاصحاء. اظهرت الدراسة ان اعلى نسبة خمج كانت لدى الاطفـال مـن ذوي فصـيلة الـدم A حيـث بلغت(42.5.%) تليها حاملي فصيلة الدم O وبلغت.(24%) فصيلة الدم B (20.4 %) وأخيرا AB فصـيلة الدم (12.9 %) .